



# 2023 Report to the Governor

## Capacity Development

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**Technical - Managerial - Financial**

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Public Drinking Water Branch  
September 2023

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# Executive Summary

In accordance with Section 1420(c) of the Safe Drinking Water Act (SDWA), Missouri is required to develop and implement a capacity development strategy to assist public water systems in acquiring and maintaining technical, managerial, and financial (TMF) capacity to receive the state's full allotment of Drinking Water State Revolving Fund Capitalization Grant funds. The SDWA also requires Missouri to submit a report on the strategy's effectiveness to the Governor every three years and to make the report available to the public. This report fulfills that requirement and is available online at [dnr.mo.gov](https://dnr.mo.gov).

In 2022, the Missouri Department of Natural Resources (Department), in accordance with Section 2012 of America's Water Infrastructure Act (AWIA) and Section 1420(c) of the SDWA, updated its Capacity Development Strategy for Existing Public Water Systems to include asset management as a critical element of Missouri's strategy. To comply with AWIA requirements, the updated strategy describes how the Department plans to encourage Missouri's public water systems to develop and implement asset management plans and best practices. It also addresses the Department's approach for providing appropriate training and technical assistance to public water system operators and decision makers to achieve this goal. The U.S. Environmental Protection Agency (EPA) approved Missouri's revised strategy in 2023.

This report covers the Department's capacity development-related activities implemented from July 1, 2020, through June 30, 2023. As of June 30, 2023, Missouri had 1,428 community water systems, 227 nontransient noncommunity water systems, and 1,123 transient noncommunity water systems. At the end of the reporting period, the population served by community public water systems meeting all health-based standards reached 98.36%.

In accordance with the Capacity Development Strategy for New Public Water Systems, the Department issued 24 Permits to Dispense during the reporting period (including new and transferred permits) to community and nontransient noncommunity water systems commencing operation after October 1, 1999.

The Department implements its capacity development activities based on public water system interest, regulatory changes, and trends in compliance. Department team members, technical assistance providers, and external organizations assist public water systems in acquiring and maintaining TMF capacity.

During the reporting period, the Department: conducted more than 14,000 compliance and technical assistance activities; approved 995 courses for drinking water training hours; issued 114 estimated casing depth letters; performed one comprehensive performance evaluation; assisted with responding to natural disasters; and improved communication and public engagement with drinking water systems through online platforms and public meetings of the Safe Drinking Water Commission.

Technical assistance providers helped support and implement the existing systems strategy through federal grants and contracts with the Department. Under EPA's Training and Technical Assistance Grant, technical assistance providers offered over 30 free drinking water-related training courses and conducted more than 297 technical assistance activities. The Department contracted with the Missouri Rural Water Association for public water system assistance to address technical, managerial, and financial capacity challenges. Under this contract, the Missouri Rural

Water Association conducted 1,040 capacity development-related assistance activities and helped public water systems conserve approximately 138 million gallons of nonrevenue water.

The Department also provided financial assistance to improve the TMF capacity of Missouri's public water systems. During the reporting period, the Department: awarded nearly \$18 million in American Rescue Plan Act grants; \$1,020,700 in engineering report grants; \$132,782 in abandoned well plugging grants; and processed \$255,555 in vouchers for continuing education of certified operators.

# 1.0 Missouri's Capacity Development Strategy

The Missouri Department of Natural Resources (Department) is pleased to present the 2023 Capacity Development Report on the effectiveness of the state's capacity development strategy, and progress toward improving the technical, managerial, and financial (TMF) capacity of the state's public water systems to Missouri's 57th Governor, Michael L. Parson. In accordance with Section 1420(c) of the Safe Drinking Water Act (SDWA), Missouri is required to develop and implement a capacity development strategy to assist public water systems in acquiring, maintaining, and demonstrating TMF capacity. The SDWA also requires Missouri to submit a report to the Governor on the strategy's effectiveness every three years and to make the report available to the public. This report fulfills that requirement and is available online at [dnr.mo.gov](https://dnr.mo.gov).

**Public water system:** Public Water System: A system for the provision of piped water to the public for human consumption, if the system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

**Technical Capacity:** The physical and operational ability of a public water system to meet Safe Drinking Water Act requirements. Technical capacity includes source water adequacy, infrastructure adequacy, and technical knowledge and implementation.

**Managerial Capacity:** The ability of a public water system to conduct its affairs in a manner that enables the system to achieve and maintain compliance with Safe Drinking Water Act requirements. Managerial capacity refers to the system's institutional and administrative capabilities, and includes ownership accountability, staffing and organization, and effective external linkages.

**Financial Capacity:** The ability of a public water system to acquire and manage sufficient financial resources to allow the system to achieve and maintain compliance with Safe Drinking Water Act requirements. Financial capacity includes revenue sufficiency, credit worthiness, and fiscal management and controls.

**Existing Public Water System:** A public water system that commenced operation on or before October 1, 1999.

**New Public Water System:** A public water system that commenced operation after October 1, 1999.

Missouri recognizes that providing safe and reliable drinking water is essential to protect human health, promote social wellbeing, and stimulate economic development. Missouri's capacity development strategy, broadly designed to provide a framework for sustainable, long-term operations of public water systems, is described in two published documents: The Capacity Development Strategy for Existing Public Water Systems and the Capacity Development Strategy for New Public Water Systems. Both documents are available online at [dnr.mo.gov](https://dnr.mo.gov). Approved by EPA in 1999, the new systems strategy applies to community and nontransient noncommunity public water systems commencing operations after October 1, 1999. The new systems strategy provides a mechanism for Missouri to assist these systems in demonstrating TMF capacity with respect to all national primary drinking water regulations (40 Code of Federal Regulations (CFR) Part 141) and Missouri's

drinking water regulations (10 Code of State Regulations (CSR) 60). The existing systems strategy (systems in operation on or before October 1, 1999) also focuses on community and nontransient noncommunity water systems, but is broadly applicable to all public water systems in Missouri. EPA approved the Department's existing systems strategy in 1999 and again in 2023, following revision and update of the original strategy.

**Community water system:** A public water system that serves at least 15 service connections and is operated on a year-round basis or regularly serves at least 25 residents on a year-round basis.

**Nontransient noncommunity water system:** A public water system that is not a community water system and that regularly serves at least 25 of the same persons over six months per year.

**Transient noncommunity water system:** A public water system that is not a community water system, which has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

In accordance with Section 2012 of America's Water Infrastructure Act (AWIA), and Section 1420(c) of the SDWA, the Department updated the Capacity Development Strategy for Existing Public Water Systems in 2022. It now describes how the Department will encourage public water systems to develop asset management plans that include best practices for asset management. The updated strategy also describes how the Department will use technical assistance to help public water systems train operators or other relevant and appropriate persons to implement the asset management plans. The Department, through solicitation from the Capacity Development Advisory Committee (CDAC), also updated the existing systems strategy to reflect current conditions and recommendations for enhancement. EPA approved the Department's updated existing systems strategy in 2023.

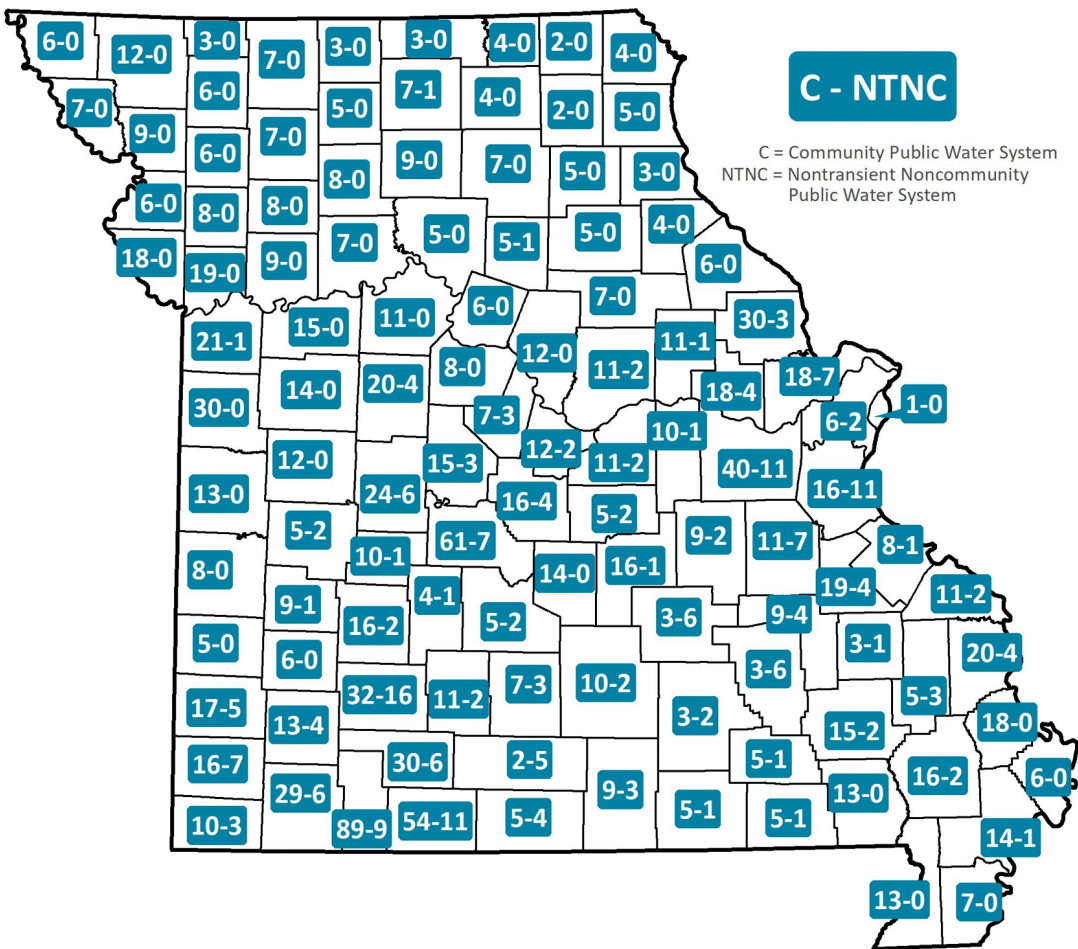
The updated existing systems strategy includes 11 elements for improving the TMF capacity of all public water systems in Missouri, an increase from the 10 elements defined in the original document. Over time, the Department has adjusted the strategy's implementation to meet the needs of Missouri's public water systems and to maintain its effectiveness.

Both the existing and new systems strategies align with the Department's mission to protect our air, land, water, and mineral resources; preserve our unique natural and historic places; and provide recreational and learning opportunities while promoting the environmentally sound and energy-efficient operations of businesses, communities, agriculture, and industry for the benefit of all Missourians. In addition, development and implementation of these strategies allow Missouri to prevent a 20% withholding from the full allotment of EPA Drinking Water State Revolving Fund Capitalization Grant funds. The Department uses these funds to provide low-interest capital improvement loans and grants to public water systems, and to fund public drinking water capacity development and other assistance efforts in Missouri.

# 2.0 Strategy Implementation and Effectiveness

This report covers the Department's capacity development activities from July 1, 2020, through June 30, 2023 (state fiscal years 2021 through 2023). At the end of the reporting period, Missouri had 1,428 community water systems, 227 nontransient noncommunity water systems, and 1,123 transient noncommunity water systems. While Missouri's existing systems strategy is a resource for all public drinking water systems, it primarily focuses on community and nontransient noncommunity water systems. The following figure illustrates the number of all active community and nontransient noncommunity water systems in the state at the end of state fiscal year 2023.

**Number of Community and Nontransient Noncommunity Public Water Systems in Missouri by County**





## 3.0 Capacity Development for New Public Water Systems

In accordance with the SDWA, Missouri requires all community and nontransient noncommunity water systems commencing operations after October 1, 1999 to demonstrate TMF capacity with respect to the national primary drinking water regulations, as described in the Capacity Development Strategy for New Public Water Systems. In accordance with state regulations, the Department assesses TMF capacity of new community and nontransient noncommunity water systems seeking permits for Construction Authorization or a Permit to Dispense.

During the reporting period, the Department issued a Permit to Dispense to 203 public water systems, including 15 new community and nontransient noncommunity water systems and nine Permit to Dispense transfers that required demonstration of TMF capacity. During the reporting period, the Department also issued 1,653 Construction Authorization permits.

**Continuing Operating Authority:** The permanent organization, entity, or person identified on the permit to dispense water who is responsible for the management, operation, replacement, maintenance, and modernization of the public water system in compliance with the Missouri Safe Drinking Water Law and rules.

A Permit to Dispense is valid only for the continuing operating authority that applied for the permit. Public water systems must notify the Department prior to transferring ownership of the public water system to another organization, entity, or person.

During the reporting period, the Department issued 66 Permits to Dispense related to the transfer of ownership of a public water system, including 65 community public water systems and one nontransient noncommunity water system.

## 4.0 Capacity Development for Existing Public Water Systems

The Department's existing systems strategy encompasses 11 elements to improve TMF capacity at existing public water systems. Element 11 was developed and incorporated into the 2022 strategy revision to encourage asset management, assist in asset management related training, and to meet requirements of Section 2012 of the AWIA. Element 11 was formally incorporated into the existing systems strategy in the last two quarters of the reporting period. Below are the 11 elements included in the updated existing systems strategy. The Department implements these elements in a variety of ways, including direct assistance, operator certification training, public drinking water decision-maker training, financial assistance, partnerships with external organizations, and public engagement. The Department prioritizes and implements capacity development activities by using feedback from public water systems received through the TMF capacity survey, tracking noncompliance trends, responding to direct requests for assistance, gathering input from field staff, and communicating changes to drinking water regulations.

## **4.1 Missouri's Capacity Development Strategy - Elements for Existing Public Water Systems**

1. Improve public water system knowledge of current and future rules and regulations.
2. Improve communication and trust among all partners.
3. Engage with citizens and public water systems on the importance of safe drinking water.
4. Encourage partnerships between agencies and public water systems.
5. Improve interagency and intra-agency communication for TMF capacity-related programs.
6. Coordinate capital resources.
7. Continue rate setting and financial management training for small public water systems.
8. Increase planning in rural areas.
9. Develop and provide board member training and TMF capacity materials and training to public water system decision-makers.
10. Continue to collect baseline data to measure the success of TMF capacity activities.
11. Encourage asset management planning and activities.

## **4.2 Asset Management**

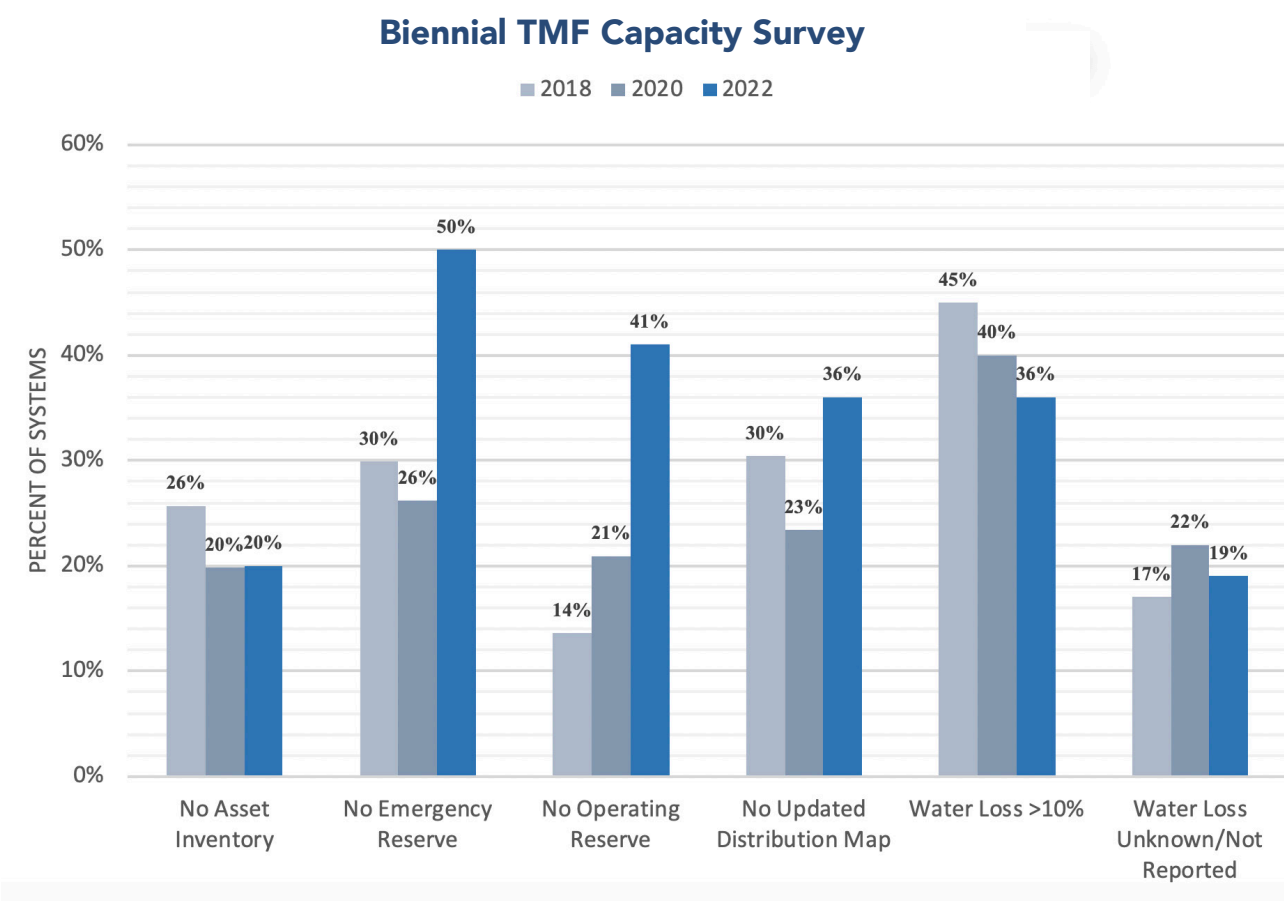
In accordance with Section 2012 of the AWIA and Section 1420(c) of the SDWA, the Department has fostered efforts to encourage public water systems to develop and implement asset management plans. The Department encourages public water systems to develop asset management plans through financial incentives, sanitary survey inspections, operator and board member training, engineering report grants, circuit rider assistance and as a target for enhancing a system's TMF capacity. Lack of or insufficient asset management planning is a common contributor to gaps in TMF capacity. For this reason, the Department strongly recommends asset management planning and training for public water systems working to maintain compliance. Combined, these efforts enhance the state's capacity development program by improving compliance and long-term planning at public water systems. This results in potential cost savings with respect to infrastructure upgrades and improved customer service.

## **4.3 TMF Survey**

In 2020 and 2022, the Department surveyed community and nontransient noncommunity water systems to assess TMF capacity. This voluntary biennial survey collects baseline data to measure the success of TMF capacity development activities and collects stakeholder input on capacity development activities. Beginning in 2018, the Department migrated the biennial TMF capacity survey to a paperless, web-based platform. By providing the survey electronically, the Department improved data integrity while reducing costs associated with mailing the survey, and entering and processing the data.

The survey helps identify TMF challenges and analyze trends. The percentage of responses for the categories No Asset Inventory, Water Loss Greater than 10%, and Unknown (or Unreported) Water Loss decreased compared to 2020. Conversely, the percentage of responses for the categories No Emergency Reserve and No Operating Reserve increased by 30% and 15%, respectively. Technical indicators, such as Systems with No Asset Inventory and Excessive (or Unknown) Water Loss, continue to trend down, while financial indicators of No Emergency or Operating Reserve increased substantially in

2022. The increase in responses to financial capacity gaps may reflect recent economic instability and pressure, increased awareness of federal financial assistance opportunities, or simply that public water systems are generally growing more aware of financial capacity shortcomings within their systems.



The TMF capacity survey also provides public water systems an opportunity to express interest in assistance types. The Department uses this information to prioritize training and technical assistance opportunities for the two years following the survey. The following table depicts the 2022 survey results for the percentage of public water systems that expressed interest in each type of assistance. Interest in assistance for Water Loss and Leak Detection remains high, while interest in Financial Management and Cybersecurity assistance increased substantially compared to the 2020 survey. Interest in Lead and Copper assistance increased more than 10% (from 18.4% to 28.6%) compared to the 2020 survey, ranking second behind Leak Detection and Water Loss. The increase in interest for Lead and Copper assistance by public water systems likely reflects revisions to the Lead and Copper Rule and efforts to satisfy Lead Service Line Inventory requirements.

## 2022 Biennial TMF Capacity Survey – Public Water System Interest

Assistance Category	Percent Interest (%)	Assistance Category	Percent Interest (%)
Leak Detection/Water Loss	32.1	Disinfectant	12.5
Lead and Copper	28.6	Sampling Techniques/Monitoring	10.7
Cybersecurity	25.0	Treatment Optimization	10.7
Distribution System Mapping	21.4	Board and Council Training	7.1
Capital Improvement Plan	19.6	Energy Use Assessment	7.1
Distribution Optimization	14.3	Succession Planning	7.1
Flushing	14.3	Water Age	5.4
Valve Location	14.3	Budget	5.4
Asset Inventory	14.3	Valve/Hydrant Exercising	3.6
Asset Management	14.3	Consolidation/Regionalization	3.6
Source Water Protection	14.3	Billing and Accounting Practices	1.8
Water Rates	14.3		

The survey also contains a question asking if public water systems are interested in learning about funding opportunities available through the Department. The Department uses the responses to coordinate capital resources and conduct outreach to public water systems regarding available financial assistance. Public water systems expressed the most interest in Infrastructure Loans or Grants (25%), followed by Engineering Report Grants (16.1%), Small Borrower Loans (5.4%), and Abandoned Well Plugging Grants (5.4%).

While the biennial TMF survey provides valuable information regarding assistance and training needs, the Department recognizes the limitations of voluntary surveys. Issues such as unpredictable response rates and limited participation, for example, prompted the Department to explore additional methods to obtain TMF baseline data. As described in the updated existing systems strategy, the Department is developing a process to integrate questions relating to capacity development and TMF capacity into routine sanitary surveys performed by Department field staff.

### 4.4 Operator Certification

At the end of state fiscal year 2023, Missouri had 1,653 public water systems that required a certified operator. Drinking water operators are responsible for maintaining the safe and reliable operation of drinking water treatment and distribution facilities. The Department provides operators the opportunity to acquire the knowledge, skill, and ability to perform their duties and keeps operators apprised of new regulations and emerging technologies through operator certification voucher and training programs.

During the reporting period, the Department approved 995 courses for drinking water training hours, with a total of 11,193 attendees. These and other Department-wide efforts helped significantly reduce the number of public water systems without a properly certified operator from 378 in state fiscal year 2009 to 28 at the end of state fiscal year 2023, which equates to 98.3% compliance.

#### **4.4.1 Drinking Water Voucher Program**

The Department issues drinking water training vouchers annually to approximately 1,450 community and nontransient noncommunity water systems that serve 3,300 people or less. Water system personnel may use the vouchers to pay operator certification fees and eligible drinking water operator training fees. This program supports multiple elements of the existing systems strategy, including improving public water system knowledge of current and future rules and regulations, as well as engaging with citizens and public water systems on the importance of safe drinking water.

During the reporting period, the Department processed 1,404 vouchers totaling \$255,555 from 604 different water systems.

#### **4.4.2 Computer-Based Exams**

On January 1, 2023, the Department's contract for exam services became effective with Water Professionals International, formerly known as Association of Boards of Certification. Previously, the Department administered exams in pencil-and-paper format during in-person group exam sessions at selected locations across Missouri. This new contract allows the Department to administer computer-based operator certification exams. Through the contract, the Department also has access to Water Professionals International's validated exam questions, which can be used to develop future exams.

On June 7, 2023, the Department began administering computer-based exams through the new contract. During the weeks leading up to the release of computer-based testing, many applicants voluntarily chose to wait to take exams by computer, even though paper exam sessions were still available. Participation in paper exam sessions dropped quickly after computer exams became available; the Department had only five examinees scheduled for the last paper session on August 1, 2023. Using exam choice as an indicator, operators seem ready for the new technology and the benefits it provides.

One of the key benefits to computer-based exams is that applicants no longer need to wait for monthly group exam sessions; they can self-schedule their exam for a date and time that is convenient to them. Another benefit is that they can schedule their exam at a test center or they can choose to take a remotely proctored exam. Examinees receive their exam score immediately upon completing the exam, without the typical lag time related to scoring hard-copy exams.

#### **4.4.3 Water and Wastewater Treatment Professionals Week**

The Department continues to highlight careers in drinking water and wastewater system operations. To feature the critical work of operators, the Department continues to develop new opportunities to engage with citizens and public water systems on the importance of safe drinking water. In 2021, Governor Parson signed a proclamation declaring August 15–21, 2021, as Water and Wastewater Treatment Professionals Week in Missouri. Governor Parson recognizes the vital role water and wastewater professionals play in our daily lives and the vital services they provide to our state. Governor Parson signed a similar proclamation in 2022, recognizing these workers during the week of September 11–17.

#### 4.4.4 Drinking Water Week

In 2021, 2022 and 2023, Governor Parson signed proclamations designating the first full week of May as Drinking Water Week in Missouri. Occurring annually nationwide during the month of May, Drinking Water Week is intended to help people be more aware of tap water's benefits and is an opportunity to recognize the vital role clean, abundant water plays in our daily lives. In recognition and celebration of Drinking Water Week, the American Water Works Association and the Missouri Department of Natural Resources hold a poster contest for Missouri fifth graders. The theme for 2023 was "There when you need it! – How tap water is essential to our daily lives." The first place winner was Olivia Esses of the Ladue Fifth Grade Center in Creve Coeur, Missouri.

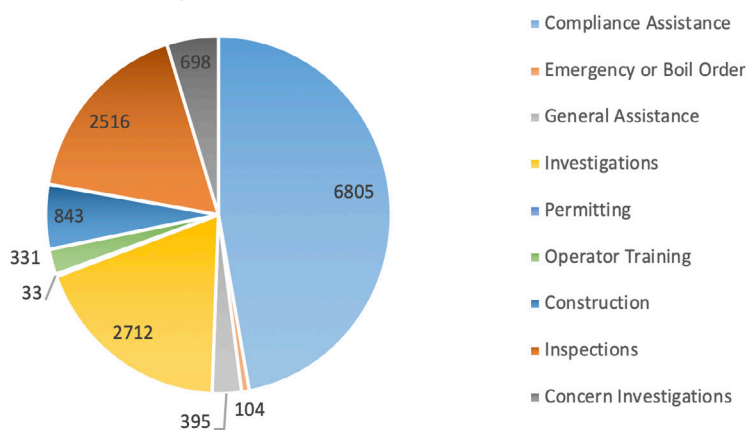


### 4.5 Field Compliance Assistance

The Department has team members located at six regional offices throughout the state. These field team members help public water systems achieve and maintain TMF capacity in different ways. These include through compliance and technical assistance with emergency or boil orders, permitting, operator training, construction, conducting inspections and investigating concerns. The figure below outlines field assistance activities during the reporting period. Field team members also provide recommendations to public water systems on drinking water operations and potential cost saving measures. The efforts of field team members support many elements of the existing systems strategy, including improving communication and building trust among all partners.

The Department provides in-person and online training, including TMF training, to field team members to equip them with the knowledge required to perform their duties effectively and efficiently. The TMF training provided to field team members in 2022 included information on TMF services available through technical assistance provider contracts, rates and reserves, source water protection plans, mapping, project funding for water systems and guidance regarding TMF checklists. In addition to training, the Department continues to promote intra-agency communication and collaboration for TMF capacity-related activities. This is achieved through policy and topic workgroups, automated tools for communication, structured communication efforts and public water system treatment tours.

#### Field Assistance Activities July 1, 2020 - June 30, 2023



#### **4.5.1 State Team Member of the Month**



Loyd Rawlings, a Water Specialist with the Southwest Regional Office, received both the Department Team Member of the Month and the Missouri State Team Member of the Month awards in July 2020 for his efforts to provide virtual training to drinking water operators after the Department cancelled in-person trainings due to the COVID-19 pandemic. Loyd quickly began researching web platforms and conducting training trial runs to test whether the virtual setting allowed for adequate interaction between teacher and student. Drinking water operators jumped at the opportunity to obtain training hours while in restricted work settings. One survey comment stated, “It allowed me to stay employed and work from home while still getting the needed operator certification training hours from the safety of my home.” Loyd collaborated and shared lessons learned with other Department Water Specialists to expand the number of virtual trainings available to drinking water operators statewide.

#### **4.5.2 Missouri Department of Natural Resources Director’s Award**

In August 2021, the Lanagan Funding Team received the Missouri Department of Natural Resources Director’s Award for their hard work and dedication to the city of Lanagan’s drinking water system upgrade. Over the span of several years, this group worked to help the city upgrade its water system and provide safe drinking water to its citizens. The team worked together to determine the most affordable compliance solution, arranged a funding package for the project, and led the community and their engineer through the funding process to successfully receive financial assistance. The project included rehabilitation of the system’s wells and well houses, replacement of hydrants, valves and meters, the addition of a new 75,000-gallon storage tank and a water treatment system designed to treat the naturally occurring radionuclides in the groundwater.



In August 2022, the Hayti Heights Team received the Missouri Department of Natural Resources Director’s Award for their efforts to assist the city of Hayti Heights with water infrastructure issues that had spanned many years. After the city’s longtime drinking water operator resigned, Hayti Heights was unable to maintain operations at the drinking water plant. Department team members worked with Hayti Heights to develop an agreement for an emergency interconnection with a nearby city, provided compliance assistance in planning for repair/replacement of the nonfunctional drinking water plant, and worked with the city on financing for engineering services and repairs. In 2022, Hayti Heights received an American Rescue Plan Act grant to rebuild the city’s drinking water plant. The Department is currently assisting the city in this project’s initial planning stages.

#### **4.5.3 Chlorine Compliance Assistance**

During the reporting period, the Department continued to utilize a compliance-assistance tool to identify public water systems that were struggling to maintain chlorine levels in the distribution system, or failing to report chlorine concentrations with their bacteriological samples. Failure to follow proper sampling protocols may be a sign of TMF capacity issues and poses a potential threat to human health. By querying chlorine data weekly, the Department can identify potential issues and field team members can offer timely compliance assistance.



## 4.6 Missouri Geological Survey

The Department provides assistance to groundwater systems with the design and construction of public drinking water wells. Improperly constructed and poorly sited water wells can result in unnecessary long-term expenditures for a public water system, reducing its TMF capacity. In order to reduce the likelihood of this occurring, the Department performs a site survey of any proposed well location for new wells that would serve public water systems to verify that the proposed site meets all well isolation standards. Isolation standards help protect public health by assuring the well's integrity. In addition, the Department's Missouri Geological Survey provides estimated casing depths, estimated total depths, and estimated yields to help public water systems determine if a proposed well location will meet their needs before incurring any drilling costs.

During the reporting period, the Department issued 114 estimated casing depth letters to community and nontransient noncommunity water systems. Because the Department works with public water systems throughout this process, it can more effectively establish communication and trust with public water systems, supporting the capacity development strategy.

## 4.7 Technical Assistance Providers

One way the Department assists public water systems in meeting state and federal SDWA standards is through partnerships with various technical assistance providers that deliver system-specific on-site visits and technical trainings throughout the state. The Department collaborates directly with technical assistance providers through contractual agreements, and indirectly through regular coordination with technical assistance and training providers funded through other channels, such as the Bipartisan Infrastructure Law and EPA's Training and Technical Assistance to Improve Water Quality and Enable Small PWSs to Provide Safe Drinking Water grant program.

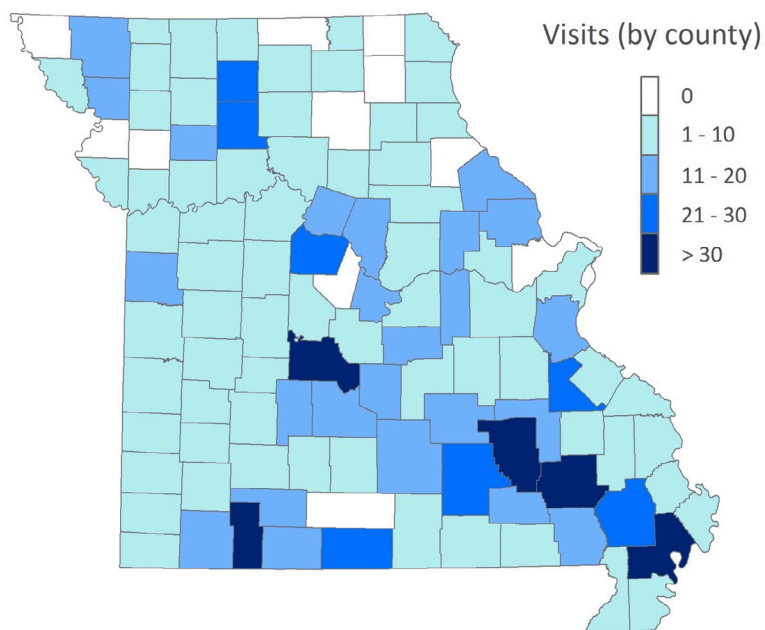
### 4.7.1 Public Drinking Water Assistance Services

The Department contracts with technical experts from the Missouri Rural Water Association, known as circuit riders, to assist public water systems that are facing TMF capacity challenges. The circuit riders provide assistance with water loss, rates and reserves, treatment, disinfection, asset management, distribution mapping, natural disasters, operator certification, board member roles and responsibilities, and source water protection. Circuit riders focus their efforts primarily on small public water systems, which can experience challenges obtaining resources to achieve and maintain TMF capacity.

During the reporting period, circuit riders provided 1,040 assistance activities to 327 public water systems. The figure below illustrates the number of assistance visits to public water systems in each county during the reporting period.



## Circuit Rider Assistance Efforts July 1, 2020 - June 30, 2023



### **Rate Assessments**

In the last three fiscal years, circuit riders provided 56 public water systems with assistance in setting sustainable rates by conducting rate assessments. Rate assessments help public water system management personnel assess the adequacy of their existing rate structure to identify if revenues are sufficient to properly operate and maintain the system. Upon request from the public water system, the circuit rider presents the rate assessment findings to the public water system's board or council.

During the reporting period, circuit riders presented assessment results to system boards and councils on 15 occasions, and seven systems raised rates following the study. Public water systems that receive this type of assistance may also receive financial management training for budgeting, training on asset inventory and asset management, and training on strategic planning.

### **Water Loss and Leak Detection**

Because of the high level of interest and requests for leak detection assistance, the Department provided more water loss and leak detection efforts than any other assistance type. Water loss and leak detection assistance helps public water systems identify nonrevenue water, including physical losses of water, as well as apparent losses (water consumed but not accounted for).

During the reporting period, circuit riders conducted 417 leak location visits to 183 public water systems, with approximately 79.4% of those visits resulting in a positive detection. Of the visits where a circuit rider identified one or more leaks, approximately 82% of public water systems repaired the leak. Public water systems that repaired leaks saved an estimated 138 million gallons of nonrevenue drinking water during the reporting period.

During the reporting period, public water systems saved enough water to fill nearly 209 Olympic-sized swimming pools because of circuit rider leak detection efforts.

#### ***4.7.2 EPA Training and Technical Assistance for Small Systems Grant***

The Department collaborates with external technical assistance providers under EPA's Training and Technical Assistance to Improve Water Quality and Enable Small PWSs to Provide Safe Drinking Water grant to determine priority topics for training and technical assistance. Training and technical assistance provided under this grant covers a range of TMF concepts and supports many elements of the capacity development strategy. These include improving public water systems' knowledge of current and future regulations, and engaging with citizens and public water systems on the importance of safe drinking water.

##### ***Midwest Assistance Program***

The Department continues to partner with the Midwest Assistance Program to assist public water systems in achieving and maintaining compliance with the SDWA. During the reporting period, the program provided technical assistance to 42 public water systems covering a range of topics, including compliance assistance with public notices and consumer confidence reports, emergency response plans, financing and budgets, TMF capacity, source water protection, and infrastructure mapping.

In 2021, the program provided four board and clerk training sessions (three virtual and one onsite) to a total of 33 attendees, and two onsite drinking water operator trainings to a total of 12 attendees. The program also provided two operator management and finance trainings (one virtual and one onsite) to a total of 16 attendees, and one onsite financial workshop to five attendees.

##### ***Environmental Finance Center***

The Department collaborated with the Wichita State Environmental Finance Center to coordinate training and technical assistance opportunities for Missouri's small public water systems. During the reporting period, the center provided multiple public trainings on Asset Management for Missouri Small Systems. One training, hosted in 2022, had 73 attendees, including 59 operators from 53 different systems. Another training hosted in 2023, had 31 attendees from 25 different communities.

##### ***Missouri Rural Water Association***

In addition to the circuit rider assistance described above, the Department partners with the Missouri Rural Water Association to provide both technical assistance and training to public water systems. From 2021 through 2023, the Missouri Rural Water Association provided more than 618 hours of training and technical assistance to Missouri's public water systems. In total, over 1,350 students from 732 utilities attended 58 formal training courses hosted by the association.

## 4.8 Disinfection Byproducts

The Department continues to work with public water systems to provide assistance, guidance, and oversight for monitoring and compliance of disinfection byproducts. The Department helps public water systems develop sampling schedules and identify sampling locations, and provides guidance on sample collection and analyses. The Department provides disinfection byproduct assistance directly through its central and field office, and through partnerships with other agencies. Technical assistance promotes many elements of the capacity development strategy, including improving public water systems' knowledge of current and future regulations, and encouraging partnerships between agencies and public water systems.

### ***4.8.1 Disinfection Byproduct Case Study***

In 2021, the Department collaborated with EPA to conduct a case study at the Mosby Public Water System. In 2018, Mosby began experiencing elevated levels of Total Trihalomethanes (TTHM) in their distribution system. The purpose of the study was to identify the best locations to collect water samples and to help the system identify where the TTHMs were forming. The study data helped Department staff identify trends in TTHM throughout the distribution system and provide best practices for reducing TTHM concentrations.

## 4.9 Per- and Polyfluoroalkyl Substances

Per- and Polyfluoroalkyl Substances (PFAS) are a group of manmade fluorinated chemicals that have been used in industry and consumer products since the 1940s for their ability to repel both water and oil. These chemicals are common in products such as non-stick cookware, carpet, clothing, furniture fabrics, waxes, cleaning products, some firefighting foams, and in industrial applications. The Department is working with public water systems to provide assistance, guidance, and oversight for identifying and monitoring PFAS. The Department has also developed an informative webpage, various educational documents, and fact sheets that are available to the public online.

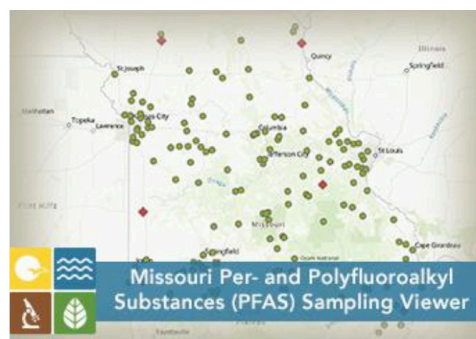
### ***4.9.1 Voluntary PFAS Monitoring for Small Water Supplies***

Through the Performance Partnership Grant, EPA has made funds available to the Department for addressing issues related to emerging contaminants. In spring 2022, the Department used these funds to begin a PFAS sampling effort. The sampling is ongoing, with a focus on systems that serve less than 3,300 in population, since these systems are not included within PFAS sampling requirements under the upcoming revised Unregulated Contaminant Monitoring Rule.

The Department has completed sampling at 171 participating community and nontransient noncommunity systems that serve 1,000-3,300 individuals. The Department is currently sampling an additional 400 water supplies that serve 300-999 individuals. The Department intends to work with increasingly smaller supplies to coordinate sampling as long as funding remains. This data will allow the Department to identify potential areas of concern and to engage with communities that exceed the PFAS health advisory level. This sampling effort will also allow public water systems to prepare and plan in advance of upcoming PFAS-related regulations.

### 4.9.2 PFAS Sampling Map Viewer

Since 2013, the Department has performed PFAS occurrence monitoring projects for public drinking water supplies through federal and voluntary sampling programs. To date, these sampling efforts represent public water supplies that serve over 76% of Missouri's population. The Department's Missouri PFAS Sampling Viewer tool identifies the public drinking water supplies across the state that are voluntarily sampling for PFAS. The viewer also allows users to browse the map and explore PFAS-related sampling data maintained by the Department. Released to the public in 2022, it has received nearly 4,000 views. The Department continues to characterize the extent of PFAS contamination at public water systems across Missouri.



### 4.9.3 PFAS Workgroup

The PFAS Workgroup is a stakeholder workgroup made up of representatives from the Department and other experts in the fields of wastewater, storm water, drinking water, chemistry, analytical methods, and environmental advocacy. The Department's Water Protection Program convened this workgroup to assess water and wastewater issues relating to PFAS. The workgroup was formed in response to stakeholder concerns regarding this emerging family of contaminants. The primary workgroup is dedicated to developing water-related policies and tools regarding PFAS, while smaller subgroups cover specific issues affected by PFAS, such as treatment options and alternatives. The Department has a drinking water-specific subgroup focused on the proposed national primary drinking water regulation for PFAS, implementation of the regulations, and the anticipated impacts to public water systems and the communities they serve.

## 4.10 Lead Service Line Inventory

According to the EPA, the most common sources of lead in drinking water are lead pipes, faucets and fixtures. This includes the service line that carries water from the public water main to a home or building. The Department is helping Missouri's water systems develop an initial Lead Service Line Inventory (LSLI), which is required for all community and nontransient noncommunity water systems. The Department has developed a webpage, various educational documents, fact sheets and informative videos focused on providing assistance with specific aspects of lead service line inventories.

### 4.10.1 Educational Efforts

The Department has produced various guidance documents to help engage water system customers in the process of identifying whether or not they have lead service lines. These documents are customizable and allow water systems to provide their specific contact information to their customers. These resources include a bill stuffer publication, door hangers, fliers, a frequently asked questions sheet and a Lead Service Line Identification Procedures video. All of these resources are available to the public on the Department's website.

### **4.10.2 Lead Service Line Inventory Spreadsheets**

The Department has developed Missouri-specific lead service line inventory spreadsheets, which are the required reporting form for each public water system. The two spreadsheets are the same, but come in different sizes in order for public water systems to utilize the one that best fits their needs. These spreadsheets and additional assistance are available on the Department's website.

## **4.11 Cybersecurity**

Cybersecurity threats against public water utilities are becoming more widespread. These attacks have potential to endanger human health by contaminating water supplied to consumers and other critical facilities such as hospitals, or disable essential services such as emergency response. Implementing cybersecurity best practices is critical for water and wastewater utilities to reduce the risk of cybersecurity threats. The Department has established a dedicated email address for reporting cybersecurity incidents at water and wastewater plants, and a cybersecurity webpage with additional resources available on the Department's website. The Department has collaborated with EPA's Water Infrastructure and Cyber Resilience Division to offer a Cybersecurity Overview and Tabletop Exercise for Water and Wastewater Utilities training. This training took place on June 15, 2023, and had over 70 attendees.

The Department's cybersecurity incident reporting email address:  
**wpp-cybersecurity@dnr.mo.gov**

## **4.12 Drinking Water Grants**

The Department offers several grant opportunities to public water systems to improve compliance with safe drinking water regulations and to improve TMF capacity. The grant programs support many elements of the existing systems strategy, including encouraging partnerships between agencies and public water systems, coordinating capital resources, and increasing planning in rural areas.

### **4.12.1 American Rescue Plan Act**

In March of 2021, Congress passed the American Rescue Plan Act (ARPA), which funded a host of COVID-19 relief measures, including an economic stimulus package focused on funding water infrastructure. ARPA provided funding to both local and state governments, with Missouri receiving more than \$2.68 billion. During the 2022 legislative session, the Missouri Legislature appropriated \$135 million of that funding to the Department for drinking water infrastructure and lead service line inventory (LSLI) programs. The Department established competitive programs to award the funds to projects in local communities, targeting those with strong financial need and persistent environmental issues. These same communities often struggle to maintain TMF capacity. By the end of the reporting period, the Department awarded nearly \$18 million to 24 drinking water and LSLI projects, and has disbursed over \$13 million in ARPA funding to grant recipients.

### **4.12.2 Engineering Report Grants**

The Department offers Drinking Water Engineering Report Grants to community water systems that serve populations of 3,300 or fewer. Engineering reports help community water systems select cost-effective solutions to TMF challenges, including compliance with national primary drinking water regulations and Missouri safe drinking water regulations. Depending on a community's needs, recommended solutions may include restructuring, regionalization, operational changes, treatment changes and infrastructure improvements, as well as other technical, managerial, or financial improvements.

During the reporting period, the Department awarded \$1,020,700 to 37 community water systems.

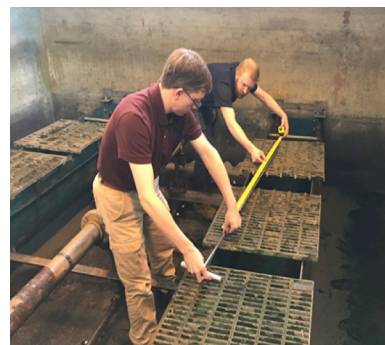
### **4.12.3 Source Water Protection**

Groundwater-based community water systems serve more than 2.1 million Missouri residents. There are also an estimated 500,000 abandoned water wells across the state. Because they present a potential contamination route, abandoned wells are a real and serious threat to Missouri's groundwater aquifers if not properly plugged. The Department offered Abandoned Well Plugging grants to groundwater-based public water systems to plug abandoned water wells that exist within the public water system's source water or service area.

During the reporting period, the Department awarded grants to 15 public water systems to plug as many as 19 abandoned wells for a total of \$132,782 in assistance.

## **4.13 Area-Wide Optimization Program**

The Area-Wide Optimization Program (AWOP) is a national initiative that assists surface water systems in optimizing treatment processes to increase public health protection. The AWOP's goals are to introduce water systems to the program, encourage partnerships, increase communication between the Department and public water systems, develop guidance materials for system operators to assist with online monitoring equipment, and to conduct Comprehensive Performance Evaluations of surface water systems that assist with and promote resolution of current treatment issues.



A Comprehensive Performance Evaluation (CPE) is a thorough review and analysis of a water treatment plant's performance-based capabilities and associated administrative, operational and maintenance practices. These performance evaluations support several elements of the existing systems strategy, such as promoting partnerships between agencies and public water systems.

In 2023, the Department's AWOP team, in conjunction with Process Applications, Inc., conducted a CPE training at the Higginsville surface-water treatment plant to address increasing turbidity amid ongoing drought conditions. This CPE provided additional information to the system about their performance-limiting factors. It also provided a unique training opportunity to Department technical staff regarding on-site testing and review methods to help determine how to improve water quality and optimize system integrity. The AWOP team can use the knowledge gained during these performance evaluations to assist other public water systems and share the information at future workshops.

## 4.14 Compliance and Enforcement

As the primacy agency in Missouri for SDWA implementation, the Department is responsible for enforcing state drinking water regulations. The Department publishes an Annual Compliance Report of Missouri Public Water Systems. At the end of calendar year 2019, 90.1% of Missouri's population was served by community water systems that met all health-based standards. This figure improved to 98.4% at the end of calendar year 2020, 98.9% at the end of 2021, and declined slightly to 98.2% at the end of calendar year 2022. At the end of the reporting period, the compliance rate was 98.36%. While the compliance rate dipped slightly in 2022, the general trend in compliance rates since 2019 demonstrates the effectiveness of Missouri's existing systems strategy, as well as the Department's dedication to protecting public health through drinking water compliance assistance and other regulatory tools.

### 4.14.1 Significant Noncompliance

During the reporting period, the Department considered 119 public water systems to be priority systems due to significant noncompliance for drinking water-related violations. Of these, 107 are no longer priority systems because of the Department's assistance efforts and enforcement actions. One form of assistance that Department field staff use is a bilateral compliance agreement. Of the systems that entered into a bilateral compliance agreement with the Department, 93% were successful in returning to compliance without further enforcement actions.

If a public water system cannot achieve compliance through assistance efforts, the Department initiates formal enforcement action. When a community or nontransient noncommunity water system enters into an administrative order with the Department to correct significant noncompliance, the Department conducts a TMF review to determine if there are technical, managerial, or financial concerns affecting the system's ability to return to compliance.

## 4.15 Natural Disasters, Water Planning and Emergency Preparedness

Missouri's public water systems are vulnerable to natural disasters such as flooding, drought, severe storms and earthquakes. While systems with adequate TMF capacity are in the best position possible to respond to and recover from an emergency incident, the Department continually works to develop resources and other types of assistance for public water systems to prepare for and respond to both natural or man-made emergency events. The statewide resources described in this section complement nearly all of the existing systems strategy's 11 elements. These include improving trust and communication, engaging citizens and fostering partnerships, coordinating capital resources, increasing planning in rural areas, and providing other information to aid and improve public water system TMF capacity.

#### ***4.15.1 Missouri Water Resources Plan***

In 2020, the Department, in collaboration with other stakeholders and partners, updated the Missouri Water Resources Plan to help identify future shortfalls in water supplies and to explore options to address identified water needs (as required by Missouri statutory law, Section 640.415, RSMo). Such options may include project recommendations for infrastructure planning, consolidation and regionalization of water supplies, and development of financial assistance opportunities.

#### ***4.15.2 Missouri Drought Mitigation and Response Plan***

While the Missouri Water Resources Plan provides a framework for long-term water planning, the Department also recognizes that public water systems often need additional assistance and guidance when responding to and recovering from acute episodes of flooding and drought. Updated in 2023, the Missouri Drought Mitigation and Response Plan serves as an informational resource to increase public awareness, enhance system resiliency, promote water conservation, improve monitoring and response planning, and to clarify roles and responsibilities. The plan includes multiple phases of drought response, and includes triggers to activate planning and response committees such as the Missouri Drought Assessment Committee and the Drought Executive Committee.

#### ***4.15.3 Missouri Hydrology Information Center***

The 2019 flooding that affected the Missouri and Mississippi river basins caused an estimated \$20 billion in losses, and analysis shows that Missouri can expect to see more frequent and intense rain events in the future. Since 2019, the Department has worked with stakeholders to develop the vision for the Missouri Hydrology Information Center (MoHIC). This has led to the understanding that the center must serve citizens during both flood and drought.

Governor Parson's recommended 2023 budget included \$10.4 million to create the MoHIC. The MoHIC will be comprised of a small group of dedicated staff from within the Department's existing Water Resources Center. The MoHIC's goals are to enhance surface water monitoring and predictive capability to protect life and property, expand soil and water supply moisture mapping, and to provide readily accessible weather conditions and forecasts.

#### ***4.15.4 Emergency Regulatory Relief***

The Department recognizes that even with extensive planning and training, responding to a natural disaster or emergency event often involves expediting regulatory procedures. Prior to the reporting period, Governor Parson issued Executive Orders (EO) 20-04, 20-09, and 20-10 in response to the COVID-19 pandemic. Following the emergency declaration, the Department suspended certain regulations related to backflow prevention assembly testing and to operator certification renewal testing. The temporary regulatory waivers expired early in the reporting period, on December 31, 2020, and February 1, 2021, respectively.



## 4.16 Consolidation and Regionalization

In an effort to help small public water systems reach and maintain TMF capacity, the Department promotes consolidation and regionalization of Missouri's water and wastewater systems. The Department's goal is to affect 25% of water and wastewater systems in 20 years. To accomplish this goal, the Department has developed several tools, including fact sheets and an online map for water and wastewater systems, to explore consolidation and regionalization opportunities. Since the beginning of 2019, the Department has assisted 94 public water systems in consolidation and regionalization efforts.

## 4.17 Communication and Public Engagement

A key element of the Department's existing systems strategy is to engage with citizens and public water systems on the importance of safe drinking water. The Department uses many avenues to promote TMF capacity to public water systems.

### ***4.17.1 Safe Drinking Water Commission***

The Safe Drinking Water Commission plays a key role in Missouri's public drinking water capacity development strategy. The commission adopts regulations for the implementation, administration, and enforcement of Missouri's safe drinking water statutes, approves the Drinking Water State Revolving Fund Intended Use Plan for grants and loans, sets the primacy fee, and advises the Department about various drinking water issues. Commission members represent various-sized public water systems and Missouri citizens. Commission meetings are open to the public and provide a valuable conduit for stakeholder input on drinking water-related issues, including capacity development activities.

During the reporting period, Department staff formally presented information regarding the implementation of Missouri's capacity development strategy to the Safe Drinking Water Commission 11 times. Additionally, Department staff provided 34 presentations on topics relevant to public water system TMF capacity, such as regulatory updates, water infrastructure funding, source water protection and emerging contaminants.

### ***4.17.2 Capacity Development Advisory Committee***

In 2000, Missouri developed the initial Capacity Development Strategy for Existing Public Water Systems with the assistance of the Capacity Development Advisory Committee (CDAC). The Department re-established the CDAC in 2021 to solicit stakeholder input on updates to the existing systems strategy. To establish the new CDAC, the Department reviewed the list of original CDAC members, along with organizations that have expressed interest in recent drinking water stakeholder groups and meetings. Each of the identified organizations received an invitation to participate on the CDAC and provide feedback on the proposed updates.

The Department held a "kick-off" meeting on May 26, 2021, to introduce the committee to America's Water Infrastructure Act and asset management, and held additional meetings on June 9, 2021 and November 4, 2021. The Department intends to hold annual CDAC meetings to discuss TMF capacity-related programs and recommends reconvening every five years, or as necessary, to review the existing systems strategy and provide recommendations to the Department on future updates and modifications.

### **4.17.3 Templates and Fact Sheets**

The Department continues to develop and revise informational resources to provide guidance and recommendations covering a wide range of water-related topics. These resources are designed to help public water systems reach and maintain TMF capacity, and to maintain compliance with state and federal drinking water laws and regulations.

During the reporting period, support materials included fact sheets and templates related to source water protection, PFAS, LSLI, and cybersecurity awareness. The Department maintains a robust library of information intended to help public water systems improve and maintain TMF capacity, and all Department publications are available to the public on the Department's website.

### **4.17.4 Water and Wastewater Digest**

The Department uses email blasts and the Water and Wastewater Digest, a periodic newsletter, to inform drinking water and wastewater operators about drinking water-related activities, regulatory issues, the voucher program, testing opportunities, and operator certification. The Department routinely uses these methods to highlight capacity development activities and assistance efforts. The Department distributes the newsletter to more than 3,900 certified water and wastewater operators, and makes it available on the Department's website.

### **4.17.5 PhoneTree**

The Department continues to utilize the PhoneTree automated notification system as a time- and money-saving resource to enhance communications with public water systems. The Department uses the system to generate automated phone calls to remind systems of upcoming deadlines concerning consumer confidence reports, lab services fees, operator certifications, and other monitoring or reporting requirements. By using this resource, the Department has reduced costs associated with mailing notices of violations and staff time once required to call individual public water systems.

During the reporting period, the Department placed 10,606 reminder calls using the PhoneTree software.

### **4.17.6 GovDelivery**

The Department uses the GovDelivery email subscription service to provide updates on drinking water-related activities to system operators and the public. The Department also uses this tool to promote TMF assistance efforts, such as training announcements. Staff use data collected in the biennial TMF survey to prioritize training topics and locations, and to notify interested parties through GovDelivery.

During the reporting period, the Department delivered 139 drinking water related bulletins to over 580,000 recipients. The Department continues to explore ways to use this tool for effective communication with system operators and the public.

#### 4.17.7 X (formerly known as Twitter)

The Department uses X, formerly known as Twitter, to engage with citizens and provide information on activities related to the Department's mission. At the end of state fiscal year 2023, the Department had more than 12,000 X followers and had posted approximately 72 drinking water-related messages during the reporting period.

Connect with the Missouri Department of Natural Resources on X (formerly known as Twitter) **@MoDNR**.

## 5.0 Continued and Future Strategy Implementation

In accordance with SDWA Section 1420(c), the Department will continue to implement the state's new and existing systems strategies. Future implementation of the strategies will focus on providing compliance assistance pertaining to technical, managerial, and financial capacity, and encouraging and assisting public water systems with the development of asset management plans.